UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/542,671	12/28/2005	Magnus Bengtsson	P17807-US2	1680

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EXAMINER
MALEK, LEILA

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _12 March 2009_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under _Ex parte Quayle_, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-21_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-21_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _12 March 2009_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Drawings

1.   The drawings were received on 03/12/2009. These drawings are accepted.

Response to Arguments

2.   Applicant's argument filed on 03/12/2009 has been fully considered but it is not persuasive.

Applicant's Argument: Applicant argues that Easton in combination with the background of invention fail to disclose truncating and saturating LSBs.

Examiner's Response: Examiner asserts that Applicant in claim 1, states: truncating the despread data symbols provided from the RAKE unit to obtain truncated data symbols represented by a second number of bits, wherein the second number of bits are selected as the least significant bits. From the above passage it is not clear whether the LSBs are the removed bits from a set of data symbols or they are the remaining bits after truncation has been performed. Therefore, examiner has given the claim its broadest reasonable interpretation. Easton discloses a rake receiver apparatus comprising: a plurality of finger front ends (see Fig. 6), wherein the outputs of the fingers have been truncated (see block 338) to obtain truncated data symbols represented by a second number of bits (see column 17, lines 29-32), wherein the second number being inherently smaller than a first number (the first number is the total number of bits before truncation), wherein the second number of bits are selected as the most significant bits (because the removed bits have been selected from the least significant bits, therefore the only the most significant bits remain) of the first number of bits representing a

despread data symbol and saturating the truncated data symbols to obtain saturated

data symbols (see column 17, lines 34-37). It would have been obvious to one of

ordinary skill in the art at the time of invention to modify Applicant's background of

invention as suggested by Easton to reduce the number of bits and as the result prevent

overflowing of the decoder (see column 17, lines 35-37). Applicant's background of

invention and Easton disclose all the subject matters claimed in claims 1 and 10, except

that the non-truncated bits are selected as the least significant bits of the first number of

bits representing a despread data symbol. Since, the whole purpose of truncation is to

reduce the number of bits, and also it is not disclosed in specification why the most

significant bits have been truncated instead of the least significant bits, examiner states

that choosing the most significant bits or the least significant bits for truncation is a

matter of design choice based on the system requirements and therefore it would have

been obvious to one of ordinary skill in the art at the time of invention to choose any of

least or most significant bits for truncation to meet the design requirements of the

system.

Claim Rejections - 35 USC § 101

3.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 20 is rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. The claimed invention is directed to a computer

program and since computer programs are not statutory subject matters, claim 20 as a

whole is directed to a non-statutory subject matter. The phrase "when said computer

program is stored on a computer readable medium and executed by a processor on a

computer" appears to be an intended use rather than a limitation.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 1-7, 10-16, and 19-21 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Applicant's background of invention, in view of Easton (US

5,764,687).

As to claims 1 and 10, Applicant in the background of invention discloses a

method/apparatus for receiving radio signals in a receiver for a digital wireless

communications system (see pages 2, 3, and 4), the method comprising the steps of:

level adjusting a received radio signal by an automatic gain control (see page 3, line 5 –

line 33); and despreading the level adjusted signal in a RAKE unit having a number of

fingers (see the description of Fig. 3, on page 10, lines 23 – page 4, line 5), thus

providing a number of despread data symbols, each despread data symbol being

represented by a first number of bits (see page 11, line 5), and level adjusting the

despread data symbols provided from the RAKE unit in dependence of the despread

data symbols (see page 11, lines 14-17). Applicant in the background of invention

discloses all the subject matters claimed in claims 1 and 10, except that the method

further comprises the steps of truncating the despread data symbols provided from the

RAKE unit to obtain truncated data symbols represented by a second number of bits,

the second number being smaller than the first number, wherein the second number of

bits are selected as the least significant bits of the first number of bits representing a

despread data symbol; saturating the truncated data symbols to obtain saturated data

symbols by replacing a truncated data symbol with the highest value that can be

represented by the second number of bits, if the value of the despread data symbol

from which that truncated data symbol was obtained is larger than the highest value,

and replacing a truncated data symbol with the lowest value that can be represented by

the second number of bits, if the value of the despread data symbol from which that

truncated data symbol was obtained is less than the lowest value; so that overflow for

the truncated data symbols is prevented. Easton, in the same field of invention,

discloses a rake receiver apparatus comprising: a plurality of finger front ends (see Fig.

6), wherein the outputs of the fingers have been truncated (see block 338) to obtain

truncated data symbols represented by a second number of bits (see column 17, lines

29-32), wherein the second number being inherently smaller than a first number (the

first number is the total number of bits before truncation), wherein the second number of

bits are selected as the most significant bits (because the removed bits have been

selected from the least significant bits, therefore the only the most significant bits

remain) of the first number of bits representing a despread data symbol and saturating

the truncated data symbols to obtain saturated data symbols (see column 17, lines 34-

37). It would have been obvious to one of ordinary skill in the art at the time of invention

to modify Applicant's background of invention as suggested by Easton to reduce the

number of bits and as the result prevent overflowing of the decoder (see column 17,

lines 35-37). Applicant's background of invention and Easton disclose all the subject

matters claimed in claims 1 and 10, except that the non-truncated bits are selected as

the least significant bits of the first number of bits representing a despread data symbol.

They also fail to disclose that saturation has been performed by replacing a truncated

data symbol with the highest value that can be represented by the second number of

bits, if the value of the despread data symbol from which that truncated data symbol

was obtained is larger than said highest value, and replacing a truncated data symbol

with the lowest value that can be represented by the second number of bits, if the value

of the despread data symbol from which that truncated data symbol was obtained is

less than said lowest value; so that overflow for the truncated data symbols is

prevented. As to the first limitation, the whole purpose of truncation is to reduce the

number of bits, and since it is not disclosed in specification why the most significant bits

have been truncated instead of the least significant bits, examiner states that choosing

the most significant bits or the least significant bits for truncation is a matter of design

choice based on the system requirements and therefore it would have been obvious to

one of ordinary skill in the art at the time of invention to choose any of least or most

significant bits for truncation to meet the design requirements of the system. As to the

second limitation, since Easton discloses (see column 17, lines 35-37) that it is

desirable to saturate MSBs to prevent overflow of the bits, it would have been obvious

to one of ordinary skill in the art at the time of invention to replace a truncated data

symbol with the highest value that can be represented by the second number of bits, if

the value of the despread data symbol from which that truncated data symbol was obtained is larger than the highest value in order to prevent overflowing of the bits, and replace a truncated data symbol with the lowest value that can be represented by the second number of bits, if the value of the despread data symbol from which that truncated data symbol was obtained is less than the lowest value in order to prevent under-flowing of the bits.

As to claims 2 and 11, Applicant in the background of invention discloses that the step of level adjusting the despread data symbols provided from the RAKE unit comprises the step of measuring the level (interpreted as power) of the despread data symbols (see page 3, lines 23-24).

As to claims 3 and 12, Easton discloses measuring the level of the saturated data symbols (see the output of block 300); and then adjusting the level of the future signal transmissions based on the measured level of the saturated data symbols (see Fig. 5, inputs and outputs of block 276 and Fig. 6, inputs and outputs of block 276). It would have been obvious to one of ordinary skill in the art at the time of invention, to modify Applicant's background of invention, by using the teaching of Easton and adjust the level of the despread data symbols provided from the rake unit based on the measured level of the saturated data symbols to shrink the size of the circuit by using the truncated and saturated bits instead of the entire number of bits.

As to claims 4 and 13, Applicant in the background of invention discloses that that level adjusting of the despread data symbols is performed by adjusting a reference value (or factor) of the automatic gain control (see page 3, lines 21-26).

As to claims 5 and 14, Applicant in the background of invention discloses that level adjusting of the despread data symbols is performed by adjusting the level of each despread data symbol individually in dependence of that despread data symbol (see page 3, last paragraph).

As to claims 6 and 15, Applicant's background of invention and Easton do not expressly disclose level adjusting based on the largest of an in-phase and quadrature phase components of the despread data symbols. However, it would have been obvious to one of ordinary skill in the art at the time of invention to perform the adjustment based on the largest I and Q values to reduce the power consumption.

As to claim 7 and 16, Applicant in the background of invention discloses level adjusting based on the data symbols averaged over time (see page 3, lines 21-24).

As to claim 19, Applicant in the background of invention discloses that the receiver is a WCDMA receiver (see page 3, last paragraph).

As to claims 20 and 21, document WO 00/69086 (i.e. the background of invention) discloses that the communication system is software implemented (see the abstract) system. It would have been extremely recognizable to one of ordinary skill in the art at the time of invention to use a computer (or a processor on a computer) to run the software programs disclosed by the background of invention and transfer orders to different parts of the communication system.

5.   Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's background of invention and Easton (US 5,764,687), further in view of Drake et al. (hereafter, referred as Drake) (US 6,366,395).

As to claims 8 and 17, Applicant's background of invention and Easton disclose all the subject matters claimed in claims 1 and 10, except that the level adjusting is performed using a proportional-integral control algorithm. Drake discloses an amplifier with a power measurement circuit for measuring the input and output power of the amplifier (see the abstract). Drake further discloses that the desired or target output power calculated by the unit 70 is provided to the error calculation circuit 24 which calculates the error between the target output power and the measured output power from the amplifier (see column 5, lines 5-15). Drake shows that the processing applied to the error signal 76 is proportional and integral control, to provide the desired control signal so that the amplifier can report rapidly to a required change in pump power (see Fig. 5, and column 5, lines 12-16). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Applicant's background of invention and Easton as suggested by Drake to rapidly adjust the level of the signal.

6.   Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's background of invention and Easton (US 5,764,687), further in view of Haddad et al. (hereafter, referred as Haddad) (US 4,715,063).

As to claims 9 and 18, Applicant's background of invention and Easton disclose all the subject matters claimed in claims 1 and 10, except that level adjusting is performed by selecting one of two different adjustment levels. Haddad discloses a communication system, wherein transmit and receive signal detectors 206 and 207 include substantially identical circuit blocks 208-245. Both detectors 206 and 207 are comprised of conventional circuit blocks including at least a gain adjust circuitry 208.

The gain adjust circuitry 208 varies the gain between two pre-selected levels depended

on the binary state of detector control signal 224 (225 for detector 207). The

logarithmic amplifier 240 extends the dynamic range of the detectors 206 and 207 due

to its amplification characteristic (see column 5, lines 30-42). It would have been

obvious to one of ordinary skill in the art at the time of invention to modify Applicant's

background of invention and Easton as suggested by Haddad to adjust the gain of the

received signal quicker (see column 6, last paragraph).

Conclusion

7.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to LEILA MALEK whose telephone number is (571)272-

8731. The examiner can normally be reached on 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone

number for the organization where this application or proceeding is assigned is 571-

273-8300.

Information regarding the status of an application may be obtained from the

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Leila Malek
Examiner
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